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# Hypertension and Related Health Issues Among Asians and Pacific Islanders in California

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## Synopsis .....

*The prevalence of controlled and uncontrolled hypertension in the United States is lower for persons ethnically classified as Asian, particularly Japanese and excepting Filipinos, than for the general population.*

*In this study, measurements of blood pressure were taken of 8,353 adults living in California,*

*including 1,757 Asians and Pacific Islanders, and the subjects were asked six questions concerning high blood pressure.*

*The results show that Asians and Pacific Islanders with hypertension, in comparison with hypertensive persons of other races, were less likely to be aware of their hypertension, to be under treatment with medication, and to be controlling their blood pressure; similarly, they had their blood pressure measured less frequently and visited physicians less often. Compared with the general population, Asians and Pacific Islanders were less knowledgeable about hypertension. In relation to health care, they recorded lower frequencies of hospital stays, days of bed disabilities, and days of not feeling well than persons of other races.*

*Asians and Pacific Islanders' lower treatment rates and knowledge level concerning hypertension may be related to the fact that a high percentage are foreign-born. Consequently, they have been taught less about hypertension, rely more on traditional methods of medicine, and are hampered by the lack of availability of health care providers of their own ethnic background. In addition, Filipinos have experienced high levels of poverty and lack of education. These factors require additional study as part of efforts to help improve health care for these ethnic groups in the United States.*

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**T**HE 1979 CALIFORNIA Hypertension Survey was one of seven statewide surveys conducted with support from the National Heart, Lung, and Blood Institute, Public Health Service. A major objective was to estimate the prevalence rate of hypertension in the total adult population (18 and older) of California. Estimates were computed for four major racial or ethnic groups: whites, blacks, Asians and Pacific Islanders, and Hispanics. Within the Asian and Pacific Islander group, separate prevalence estimates were determined for Chinese, Japanese, Filipino, and other Asians and Pacific Islanders (a residual group composed of non-Filipino Pacific Islanders, Vietnamese, Koreans, and other East Asians). Another survey goal

was to determine the extent to which hypertensive persons were aware of their condition, were under treatment, and were controlling their hypertension. Information was sought about screening techniques in use and the person's knowledge of hypertension, frequency of medical visits, hospital stays, and bed disabilities days restricted to bed rest (1-3).

The California Hypertension Control Program (HCP), which implemented the California Hypertension Survey, has supported various major hypertension projects in California. Between 1980 and 1982, the program funded the Asian and Pacific Islander High Blood Pressure Control Task Force. The task force served Asian and Pacific Islander communities throughout the State by

providing an array of public, patient, and professional education programs; enhancing cooperation and coordination among Asian and Pacific Islander health organizations; translating hypertension education material into various Asian and Pacific Islander languages; developing community resource lists of health providers; collecting blood pressure data; and publishing a newsletter.

## Review of the Literature

Few published epidemiologic studies deal with the blood pressure of Asians and Pacific Islanders living in the United States. In different areas of Japan, rates of hypertension vary considerably, presumably owing to widely differing levels of sodium intake. This phenomenon may lead to distorted comparisons between Japanese living in Japan and the United States (4). Cabral and coworkers (5) discovered that elderly (50 to 74 years) men in Japan had mean systolic blood pressure 9 mm Hg. higher and diastolic blood pressure 3 mm Hg. higher than elderly American men in the United States. Conversely, Kagan and coworkers (6-8) found both average systolic and diastolic blood pressures 6 mm Hg. higher for Japanese men between 45 and 69 years of age living in northern California than for their counterparts in Japan. Japanese men residing in Hawaii showed blood pressure averages almost equal to those of men in Japan.

Findings are more consistent for Chinese. Three studies undertaken between 1922 and 1934 found the mean systolic blood pressure to be at least 10 mm Hg. lower for Chinese living in China than for the general populations of Americans or Europeans residing in their home countries (9-11). In the People's Republic of China, the prevalence of hypertension has increased markedly during the modernization following the 1949 revolution. Between 1958 and 1973, the rate of hypertension increased by 46.4 percent in Beijing and by 19.7 percent in Shanghai, according to large regional surveys (12).

Cabral and coworkers (5) measured the blood pressure of more than 5,000 randomly selected persons older than 50 residing in the Philippine Islands. They found average systolic blood pressures of Filipino men aged 50 to 74 years to be 4 mm Hg. lower than for American men of the same age group living in the United States. Filipino women had average blood pressures 9 mm Hg. lower than for the general population of American women living in the United States (5).

Stavig and coworkers (13) found that for Asians and Pacific Islanders in the United States hypertension relates positively to age, body mass index, being male, and to a psychological dimension which includes quantity of alcohol intake and proneness to boredom and depression. They found hypertension to be related negatively to the social support mechanisms of being married, having a large number of friends, and belonging to a church. Whereas these studies examined only the prevalence of hypertension, our study expanded these discussions by examining the knowledge and treatment of hypertension among Asians and Pacific Islanders.

## Methods

In 1979, a random probability sample of households whose adults were representative of California's adult noninstitutionalized population was interviewed and blood pressures measured. Asians, Pacific Islanders, and blacks were oversampled in order to include sufficiently large numbers of these ethnic groups to obtain meaningful statewide estimates of their prevalence. A total sample of 8,353 adults, including 1,757 Asians and Pacific Islanders, was drawn, using standard probability sampling techniques. Details of the complex multistage methodology have been reported elsewhere (14-16).

Professional interviewers fluent in an Asian or Pacific Islander language were used in the survey fieldwork. The interviewers were taught a standardized method of measuring blood pressure and how to fill out questionnaires. Three blood pressure measurements were taken in a sitting position during the course of the interview in the respondent's home. The average of the second and third readings was used to determine the respondent's blood pressure level. Interviewers were allowed to make up to four calls to a household to complete the household record for initial assignment work. Nonresponse categories included refusal, not at home, out of town, too ill, language problems, and "other" nonresponse as a catch-all for situations not covered by the first five categories. The response rate was 82 percent of persons for the entire sample and 79 percent of persons for Asians and Pacific Islanders. This percentage is the number of completed interviews divided by the number of attempted interviews.

Questionnaires were translated into Chinese, Japanese, and Tagalog. Interpreters were provided for households in which no one spoke English.

Table 1. Hypertension characteristics of adult population of California: weighted results by age, sex, and race

Groups	Unweighted sample size	Prevalence (percent)	Percent uncontrolled hypertensive	Percent of hypertensives who are:				
				Aware	Treated	Controlled	Aware and treated	Treated and controlled
Overall	8,353	24.0	19.8	56	40	16	71	40
Men	3,898	26.6	23.5	52	30	11	58	37
Women	4,455	21.6	16.5	68	51	22	75	43
18-49 years	5,724	12.1	10.7	46	23	12	50	52
50 years and older	2,629	46.8	37.4	66	48	19	73	40
Ethnicity:								
Black	1,436	33.8	26.1	65	49	21	75	43
Asian and Pacific Islanders	1,757	20.0	18.3	54	36	9	67	25
Chinese	644	18.1	15.7	46	35	13	76	37
Japanese	453	14.1	12.5	57	27	8	47	30
Filipino	422	26.6	24.5	63	49	8	78	16
Other A-P	238	20.8	20.1	49	18	4	37	22
18 to 49 years:								
Black men	451	28.3	25.4	35	24	10	68	42
Black women	523	14.5	9.3	77	52	36	68	69
Asian and Pacific Islander men	541	21.5	20.6	47	28	4	60	14
Asian and Pacific Islander women	589	5.1	4.7	53	44	8	83	18
Chinese men	197	13.3	11.8	32	21	11	66	52
Chinese women	195	7.1	6.4	...	...	...	...	...
Japanese men	123	19.8	19.2	35	12	3	34	25
Japanese women	147	0.9	0.4	...	...	...	...	...
Filipino men	111	30.5	29.5	62	52	3	84	6
Filipino women	160	6.7	6.5	...	...	...	...	...
Other A-P men	110	28.5	28.5	...	...	...	...	...
Other A-P women	87	3.2	3.2	...	...	...	...	...
50 years and older:								
Black men	196	67.1	52.9	71	51	20	72	39
Black women	266	63.1	44.4	82	72	24	88	33
Asian and Pacific Islander men	322	49.1	42.7	62	40	13	64	32
Asian and Pacific Islander women	305	37.1	32.2	52	41	11	79	27
Chinese men	124	50.3	45.0	58	40	11	69	28
Chinese women	128	42.6	34.3	55	52	19	94	36
Japanese men	85	32.3	29.1	72	37	10	51	27
Japanese women	98	17.5	13.9	60	32	8	53	25
Filipino men	93	60.0	50.8	67	43	15	64	35
Filipino women	58	65.2	61.3	49	39	6	80	15
Other A-P men	20	53.5	45.2	...	...	...	...	...
Other A-P women	21	42.2	42.2	...	...	...	...	...

The survey questions used to determine levels of understanding about high blood pressure follow:

1. Do you think high blood pressure leads to serious, mild or no other illnesses or diseases?
2. If a person answered "serious" or "mild," he or she was asked: What do you think some of these illnesses and diseases are? (open ended)
3. As you understand it, when does a person feel the signs or symptoms of high blood pressure—as soon as he gets high blood pressure, after a short time, after a long time, or never?
4. Is it your impression that there are ways to lower high blood pressure?

5. If a person answered "yes," he or she was asked: what ways? (open ended)

6. Once a person with high blood pressure gets his pressure down to a normal level, would you say he can stop the treatment altogether, or must he continue to take treatment, or will he need to take treatment only from time to time?

## Results

**Prevalence, awareness, treatment, and control.** Table 1 provides estimates of the prevalence of high blood pressure in 1979 for the Asian and Pacific Islander population of California. The

estimates were derived under a definition of hypertension of a systolic blood pressure greater than or equal to 140 mm Hg., or a diastolic blood pressure greater than or equal to 90 mm Hg., or taking medication for high blood pressure, regardless of level. This definition was specified by the National Heart, Lung, and Blood Institute, and it was used by all seven States engaged in comparable statewide surveys. These cutoff points allowed a suitable sample size in the analysis of the Asian and Pacific Islander data.

Prevalence estimates were lower for Asians and Pacific Islanders (20.0 percent) than for the overall California population (24.0 percent). Rates of hypertension were remarkably low for Japanese (14.1 percent), particularly women aged 18 to 49 (0.9 percent). The rate for Japanese women 50 and older (17.5 percent) was less than half of the corresponding rate for women of any other ethnic group in that age category. Conversely, Filipinos had a prevalence rate (26.6 percent) second only to blacks (33.8 percent). Prevalence among Filipino men aged 18 to 49 (30.5 percent) exceeded that of blacks (28.3 percent), as did the rate for Filipino women 50 and older (65.2 percent versus 63.1 percent). The proportion of persons with uncontrolled hypertension (for example, a systolic blood pressure equal to or greater than 140 mm Hg., or diastolic blood pressure equal to or greater than 90 mm Hg.) among the total population was 19.8 percent (column 3). The difference between 24.0 percent and 19.8 percent is the 4.2 percent who were controlled as a result of successful antihypertensive drug therapy. Filipinos' rate of uncontrolled elevated blood pressure (24.5 percent) approached the well-documented high rate for blacks (26.1 percent).

Awareness, treatment, and control status are examined for hypertensive persons in columns 4 through 6. Of the 24.0 percent of adults who were hypertensives, 56 percent were aware of their condition; 40 percent were aware and under treatment; and only 16 percent were aware, under treatment, and controlled. By definition, a controlled hypertensive was a person with blood pressure below 140 mm Hg. systolic, below 90 mm Hg. diastolic, and taking antihypertensive medication.

Asians and Pacific Islanders with hypertension were less likely to be aware (54 versus 56 percent), under drug treatment (36 versus 40 percent), or controlled (9 versus 16 percent) than the overall hypertensive population. Filipinos, with the highest rates of elevated blood pressure of any Asian and

Pacific Islander group, were the most likely to be aware (63 percent) and to be under treatment (49 percent), but were poorly controlled (8 percent). The poorest performance was recorded by other Asian and Pacific Islander hypertensives (such as Koreans, Vietnamese, and Cambodians): only 49 percent were aware, 18 percent were under drug treatment, and 4 percent were controlled. While 71 percent of all aware hypertensives (column 7) were under drug treatment, the corresponding figures were 47 percent for Japanese and 37 percent for other Asians and Pacific Islanders. A particularly alarming finding was the extremely low control rate for Japanese (8 percent), Filipino (8 percent) and other Asians and Pacific Islanders (4 percent). Only 16 percent of Filipinos and 22 percent of other Asians and Pacific Islanders (column 8) who were taking antihypertensive medicine were controlled, compared to 40 percent of the general population.

**Screening and treatment.** Compared to 11.6 percent of the total population (table 2), 18.1 percent of the Asian and Pacific Islander population said in 1979 that they had not had their blood pressure measured within the previous 2 years. Overall, 78.3 percent of adult Californians reported that they had visited a physician within the past year, compared to 69.3 percent of Asian and Pacific Islander adults. The percentage reporting that they had visited a physician within the past year was higher among women (84.3 percent) than men (71.8 percent), and among older adults (81.5 percent) than younger adults (76.6 percent). Of those who said that they had visited a physician in the past year, an estimated 98.8 percent had their blood pressure measured at one or more of these visits. For Chinese, only 90.3 percent had a blood pressure reading taken while visiting a physician. Owing to limited resources, no attempt could be made to validate these reports.

Continuing medical surveillance of hypertension is necessary to ensure proper case management and control. As seen in table 2, 11.9 percent of the California adult population had visited a physician about their blood pressure within the previous 6 months. Of all hypertensives (aware and unaware), 40.5 percent had gone to a physician concerning their blood pressure in the previous 6 months. Of those persons who had ever been told by a physician that they had high blood pressure, 55.3 percent had visited a physician concerning their blood pressure in the previous 6 months. Asians and Pacific Islanders fell below the mean for the

Table 2. Blood pressure measurement, physician visits, and treatment for hypertension among adult population of California, by age, sex, and race

Groups	Percent had BP taken within 2 years	Percent saw physician within 1 year	Of col. 2, percent had BP taken within 1 year	Percent had seen physician about BP within 6 months	Percent hypertensives had seen physician about HBP within 6 months	Percent of aware hypertensives who:			
						Had seen physician about HBP within 6 months	Take prescription medication for HBP	Take non-prescription medication for HBP	Do something else for HBP
Overall .....	88.4	78.3	98.8	11.9	40.5	55.3	44.9	2.6	22.9
Men .....	85.4	71.8	98.3	10.6	32.8	53.0	42.9	2.9	22.3
Women .....	91.2	84.3	99.2	13.1	49.2	57.2	46.7	2.4	23.4
18-49 years .....	87.0	76.6	98.8	4.8	25.8	37.6	22.1	2.1	18.1
50 years and older ..	91.1	81.5	98.9	25.4	47.7	66.8	59.9	3.0	26.0
Asian and Pacific									
Islanders .....	81.9	69.3	96.0	8.2	34.8	55.8	51.8	8.8	20.5
Chinese .....	82.6	67.4	90.3	7.1	33.6	70.2	74.8	1.8	10.1
Japanese .....	81.1	73.4	99.5	4.5	24.4	37.5	17.5	1.4	25.7
Filipino .....	83.5	69.5	99.4	13.0	46.9	56.0	55.8	18.1	32.2
Other A-P .....	78.7	67.8	97.0	7.4	20.6	54.3	39.5	...	...
18 to 49 years:									
Chinese men .....	80.5	72.1	95.1	1.9	7.3	31.8	75.0	0.0	18.7
Chinese women .....	85.8	80.5	95.4	1.1	14.5	36.6	24.3	0.0	8.4
Japanese men .....	94.0	86.7	100.0	2.0	9.6	21.0	74.3	0.0	15.6
Japanese women .....	76.9	63.0	100.0	1.6	38.5	35.0	13.0	0.0	4.5
Filipino men .....	82.8	80.4	99.6	17.1	52.6	73.0	74.6	74.6	5.0
Filipino women .....	88.6	84.3	99.6	2.0	30.2	13.6	45.6	0.0	52.6
Other A-P men .....	70.2	52.3	...	4.9	17.2	30.7	43.4	0.0	0.0
Other A-P women .....	90.0	76.7	...	7.4	2.6	81.8	9.2	0.0	0.0
50 years and older:									
Chinese men .....	82.7	66.5	81.4	30.0	52.6	91.8	62.8	2.3	0.0
Chinese women .....	82.1	63.1	96.6	25.0	52.8	88.3	94.8	3.2	12.9
Japanese men .....	88.7	76.4	100.0	15.5	37.3	57.4	14.6	2.1	43.6
Japanese women .....	73.0	71.8	98.6	4.7	26.3	27.7	10.2	2.3	20.4
Filipino men .....	92.0	58.1	98.4	30.3	49.0	71.0	43.7	2.4	14.3
Filipino women .....	77.5	70.3	99.8	28.8	43.6	85.2	75.3	0.0	95.2
Other A-P men .....	75.8	57.1	99.7	17.1	31.9	71.5	40.5	0.0	0.0
Other A-P women .....	82.0	81.0	95.7	11.5	27.2	94.2	0.0	0.0	0.0

BP = blood pressure, HBP = high blood pressure.

first five indices concerning physician visits and blood pressure treatment given in table 2. Particularly disturbing is the fact that only 24.4 percent of Japanese and 20.6 percent of other Asians and Pacific Islanders with hypertension had seen a physician about their elevated blood pressure in the previous 6 months, compared to 40.5 percent of the California hypertensive population.

Columns 7 through 9 provide the percentages of respondents taking medicine prescribed by a physician, medicine not prescribed by a physician, or following a nonpharmacological regimen for the alleviation of high blood pressure. For the entire population, 44.9 percent of the adults who had been told by a physician that they were hypertensive were taking antihypertension prescription medicine. The percentage of hypertensives taking prescription medicine varied considerably among age and ethnic groups. Chinese (74.8 percent), elderly (59.9 percent), and Filipinos (55.8

percent) were most likely to take prescription medicine. Japanese (17.5 percent), adults 18 to 49 years (22.1 percent), and other Asians and Pacific Islanders (39.5 percent) were less apt to take prescription antihypertensive medicine.

Asians and Pacific Islanders (8.8 percent) and Filipinos, in particular (18.1 percent), were most apt to take medicine not prescribed by a physician for high blood pressure. The percentage for Filipinos should be interpreted with caution since it was based on a relatively small sample size ( $N = 46$ ) and was subject to a large standard error. Some persons were diagnosed by a physician as hypertensive, but the physician did not prescribe antihypertensive medicine.

A much larger percentage of hypertensives older than 50 years (26.0 percent) were involved in nonpharmacological therapy than were adults younger than 50 (18.1 percent). Filipinos (32.2 percent) were more likely to follow alternative

Table 3. Percent of adults in California responding correctly to questions about high blood pressure, by age, sex, and race

Groups	Does HBP lead to serious . . . ?	What do you think some of these . . . are?	When does a person feel the signs . . . ?	Are there ways to lower HBP?	What ways?	Once normal, can he stop treatment?
Overall . . . . .	78.7	71.7	31.4	87.1	82.2	52.4
Men . . . . .	77.8	69.7	32.7	86.6	80.4	49.0
Women . . . . .	79.6	72.5	30.3	87.5	83.9	55.6
18-49 years . . . . .	78.6	70.3	29.5	86.5	81.6	51.3
50 years and older . . . . .	79.0	72.7	35.1	88.1	83.4	54.6
Asian and Pacific Islanders . . . . .	67.6	56.8	20.7	72.0	66.0	42.1
Chinese . . . . .	49.5	42.2	15.4	66.5	61.1	42.6
Japanese . . . . .	80.0	73.0	24.4	76.8	75.0	49.5
Filipino . . . . .	72.3	60.8	26.0	78.2	70.7	31.5
Other A-P . . . . .	79.5	57.6	15.7	64.2	54.0	53.6
18-19 years:						
A-P men . . . . .	71.8	62.7	27.1	71.1	62.7	35.7
A-P women . . . . .	69.1	55.1	21.1	79.0	73.2	48.6
50 years and older:						
A-P men . . . . .	57.4	45.5	12.9	59.2	56.4	40.7
A-P women . . . . .	63.8	61.4	12.8	65.0	60.0	36.9

NOTE: HBP = high blood pressure.

therapies, while Chinese were less likely (10.1 percent). The most commonly applied adjunctive, nonpharmacological therapies were special diets, salt restriction, exercise programs, weight reduction, rest, relaxation, stress reduction, and a reduced work schedule.

**Knowledge about high blood pressure.** The first two questions in table 3 were intended to measure knowledge of the consequences of hypertension. The third question dealt with the asymptomatic nature of the disease. Overall, 78.7 percent of California adults and 67.6 percent of Asian and Pacific Islander adults responded (correctly) that high blood pressure leads to "serious" illnesses. A followup question was asked of persons who responded "serious" or "mild," asking them to identify some of these illnesses. Seventy-one percent of Californians were able to name correctly one or more of these illnesses, compared to 56.8 percent of Asians and Pacific Islanders. Only 31.4 percent of Californians and 20.7 percent of Asian and Pacific Islander adults knew that the symptoms of high blood pressure are "never felt," and 13.0 percent said they are "felt after a long time."

The last three questions were designed to determine the respondent's knowledge about the treatment of high blood pressure. Fully 87.1 percent of Californians, compared to 72.0 percent of Asians and Pacific Islanders, responded (correctly) that "there are ways to lower high blood pressure."

Persons who knew there were ways to lower high blood pressure were asked what types of treatment will lower high blood pressure. From this subgroup, 82.2 percent of Californians and 66.0 percent of Asians and Pacific Islanders were able to name one or more ways to lower blood pressure. Only 52.4 percent of all California adults and 42.1 percent of Asians and Pacific Islanders believed a person must "continue to take treatment" after he has his blood pressure down to normal.

Table 3 shows that Asians and Pacific Islanders, in spite of high average levels of education, are less knowledgeable and less well informed about the consequences, nature, and treatment of high blood pressure than the general adult California population. Asians and Pacific Islanders answered the six questions with an average of only 79.2 percent as many correct answers as the overall California population. They fared best on the first question, concerning the consequences of high blood pressure (85.9 percent as well as the general population), and worst on the third question, dealing with the asymptomatic nature of hypertension (65.9 percent as well as the general population). Among Asians and Pacific Islanders, Japanese are the most knowledgeable about hypertension, although in general they are less well informed than the overall population. Chinese demonstrated a definite lack of understanding about the consequences and nature of hyperten-

Table 4. Percent of adult population of California reporting having heard about high blood pressure within 1 year, by sex and race

Groups	Percent
Overall .....	79.5
Men.....	78.5
Women.....	80.4
18-49 years .....	81.1
50 years and older .....	76.5
Asian and Pacific Islanders.....	72.9
Chinese .....	64.7
Japanese.....	65.6
Filipino .....	84.2
Other A-P .....	77.3

sion. Only 42.2 percent of Chinese who knew that high blood pressure can lead to serious illnesses were able to identify any of these illnesses. The least well informed of all Asian and Pacific Islander groups is the elderly male population (older than 50). Only 12.9 percent of elderly Asians and Pacific Islanders knew of the asymptomatic nature of elevated blood pressure, compared to 35.1 percent of the overall elderly population. This information is valuable in planning health education programs for Asians and Pacific Islanders.

Table 4 shows the percent of respondents who had heard anything about high blood pressure from the media during the prior year. The results provide information relevant to the issue of use of mass media and other approaches to disseminating information about high blood pressure. More than three-fourths of those sampled had heard about high blood pressure. Asians and Pacific Islanders, particularly Chinese and Japanese, are the ethnic groups least likely to be reached by the media with a message about hypertension.

**Hospital stays and bed disabilities.** To improve a community's health status, it is useful to know about health practices and use of health care resources in that community. Table 5 provides data from our 1979 survey on California adults concerning hospital stays, periods of not feeling well, and bed disabilities. The survey estimate shows that 12.5 percent of adult Californians 18 and older stayed in a hospital overnight or longer during the past 12 months. This figure includes hospitalizations for obstetrical delivery. Hospitalization increased linearly with age, women experienced a higher rate of hospitalization than men,

and the rate of hospital discharges was slightly higher for whites than for nonwhites. Hospitalization rates for Chinese were markedly lower than the rates for other Asians and Pacific Islanders.

Table 5 specifies the percentage of persons not well (defined as not being able to do the things they usually do, such as go to work or do household chores) during the past 2 weeks and the percentage who stayed in bed all or part of a day at some time during the previous 2 weeks. The demographic pattern of responses to these questions was similar to the prior question dealing with the level of hospitalization. Women and the elderly most often did not feel well or stayed in bed during the previous 2 weeks. The most pertinent finding in table 5 is the low rate of hospital stays, reports of not feeling well, and bed disability because of illness of Asians and Pacific Islanders, particularly Chinese and Japanese. The percentage of Asians and Pacific Islanders who did not feel well during the preceding 2 weeks was 8.0 percent, compared with 15.4 percent for the overall population. The percentage who stayed in bed all or part of the day during the preceding 2 weeks because they were not feeling well was 4.9 percent, compared with 9.7 percent. Of those confined to bed, Asians and Pacific Islanders remained in bed an average of only 70 percent as long as the general population (2.8 days versus 4.0 days).

The low rates of hospital visits or bed disabilities for Asians and Pacific Islanders may be attributable in part to a lack of use of the medical system. Respondents were asked whether they had seen a physician for any reason in the past year. Only 69.3 percent of Asians and Pacific Islanders had seen a physician, compared to 78.3 percent of the overall population.

## Discussion

The data are useful for program planning and evaluation. They have been used by the California Hypertension Control Program to establish program objectives and measurable goals for various racial and ethnic groups. Since 46 percent of hypertensive Asians and Pacific Islanders are unaware of their condition (table 1), a great deal of effort should be devoted to focusing public and provider attention on the screening process. Early, competent, and continuous medical management is equally important. Achieving blood pressure control depends not only on prescribing the appropriate treatment, but on continuous monitoring to assure patient adherence to the prescribed regi-

Table 5. Hospital stays, bed disabilities, and not feeling well among adult population of California, by sex and race

Groups	Percent in hospital past year	Percent not well past 2 weeks	Average number of days not well	Percent stayed in bed past 2 weeks	Average number of days stayed in bed
Overall .....	12.5	15.4	5.0	9.7	4.0
Male .....	10.2	11.5	5.7	6.8	4.7
Female .....	14.6	18.9	4.7	12.3	3.7
18-49 years .....	11.4	14.8	3.9	9.3	3.0
50 years and older .....	14.6	16.5	6.9	10.3	5.7
Asian and Pacific Islanders .....	9.2	8.0	4.9	4.9	2.8
Chinese .....	3.9	5.4	2.9	4.6	2.0
Japanese .....	11.6	5.2	4.7	3.7	3.6
Filipino .....	11.3	10.0	3.5	6.6	3.0
Other A-P .....	13.0	13.1	9.2	3.5	3.1

mens. The failure of patients to obtain treatment for elevated blood pressure, despite awareness of its presence, may result from failure to seek medical care, or from physicians' reluctance to initiate and maintain treatment (17).

The 1979 California Hypertension Survey afforded the HCP an opportunity to determine levels of knowledge about hypertension among Asian and Pacific Islander subgroups. Patient and consumer education regarding the nature of hypertension is an integral component of the HCP and regional and local control projects. The HCP must determine the efficacy of the component parts of its educational program in order to plan and improve its efforts directed at reducing uncontrolled hypertension. It must determine the current level of understanding about hypertension as part of its continuing effort to measure the impact of a coordinated statewide program to control hypertension (15).

For the Asian and Pacific Islander population, the three strongest predictors of hypertension prevalence are age ( $r^2 = .135$ ), body mass ( $r^2 = .070$ ), and education ( $r^2 = .038$ ). Since these relations explain only a small part of the variance, other factors must be sought which explain prevalence of hypertension.

Two factors are present in the low prevalence of hypertension among Asians and Pacific Islanders. Since World War II, immigrants from Asia represent a relatively select group of people, well educated and in good health. In 1980, Asians (many of whom are foreign born) had the most number of years of education, lowest unemployment levels, and highest income of any ethnic group in the United States (18). Asians who migrate to the United States may adhere to a lifestyle similar to their native culture in which

blood pressure levels tend to be low (with the exception of high salt intake in areas of Japan).

The superior health status of Japanese in California is manifested by many indices. Their life expectancy is high, infant mortality is low, and they report fewer physical disabilities than other ethnic groups (19). Their low blood pressure may reflect a more general condition, such as high overall health or host resistance.

In spite of high educational attainment, Asians and Pacific Islanders recorded consistently below average rates of screening, awareness, treatment, and control of hypertension. Furthermore, they demonstrated a lower level of knowledge about high blood pressure than any other major racial grouping. Three factors relate to the low treatment rates and knowledge levels concerning hypertension.

First, a high percentage of Asians and Pacific Islanders in California are foreign-born. In 1970, 58 percent of Filipinos, 46 percent of Chinese, 21 percent of Japanese in California, and 62 percent of Koreans in Los Angeles were foreign-born (20). It is quite possible that these people received less information about hypertension in their native countries.

Second, western medical care sometimes conflicts with traditional Oriental treatment. Most Chinese immigrants believe both Asian and western medicines have therapeutic value. Chinese medicine has a long tradition of scientific medical practice in China. Believing that a combination of eastern and western medicine is best, some Chinese Americans may adhere to folk medicine and take herbs when seeking aid from a western physician. When they experience an adverse reaction to western medicine, it may reinforce interest in traditional medicine. Some Chinese immigrants are

*Some Asians and Pacific Islanders do not seek adequate medical help because of the unavailability of health care providers of their own ethnic background. For some, apprehension, distrust, and fear may accompany the use of health care services provided by non-Asian or Pacific Islander providers.*

reluctant to enter hospitals that require them to accept all aspects of western medical care. Traditional Chinese medicine characterizes foods as hot or cold, linking them to specific illnesses. American hospital food may run counter to Chinese medical practices and may be considered an impediment to recovery (21,22).

Third, some Asians and Pacific Islanders do not seek adequate medical help because of the unavailability of health care providers of their own ethnic background. For some, apprehension, distrust, and fear may accompany the use of health care services provided by non-Asian or Pacific Islander providers. Many of the foreign-born lack information and knowledge about the American system of health care services. Some immigrants cannot effectively communicate with western health providers because of language difficulties and a lack of bilingual health professionals to assist them (17,23,24).

Differential rates of hypertension among Asians and Pacific Islanders may be explained in part by examining their diverse historical background in the United States. The comparatively low blood pressure of home island Filipinos offers strong evidence that sociocultural rather than genetic factors are responsible for the high rate of hypertension among Filipinos in the United States (5). Many factors may be suggested in relation to possible higher stress and lower levels of social support among Filipinos. Many Filipino men migrated to the United States between the two world wars and were employed as agricultural laborers, cannery workers, waiters, and hotel attendants. In 1970, 26.5 percent of Filipino men were service workers, compared to the national average of 8.1 percent (25). Filipino women were excluded from migrating to the United States after 1934 by the Philippine Independence Act. The men often were

not permitted to marry mainland women because of miscegenation laws. Only after World War II did Filipino Americans find it possible to establish families. As a consequence of the shortage of women, many Filipino men never married. In 1970, 63 percent of the Filipino elderly poor lived alone, many as bachelors without social or family support (26).

Owing in part to a lack of formal education and acute poverty, Filipino immigrants were confronted with stressful problems in a foreign, unfamiliar, and often hostile society with cultural norms and values widely differing from their own. They often lacked adequate housing and health care, were unemployed or underemployed, or suffered from a language barrier. Unlike Chinese or Japanese, many Filipinos did not receive support and assistance from an integrated ethnic community or ghetto. Many lived a rural, migratory lifestyle that impeded the development of a Filipino community for many years. Many older Filipino men have had very little formal schooling; the median number of years of schooling completed by Filipino men 65 and older is 5.4 years. Lack of education, accompanied by poverty, became an established cycle. In 1970, 43 percent of Filipino men in California had annual incomes of less than \$4,000, compared to 29 percent of the Japanese and a national average of 31 percent (26).

The Chinese were the first Asian or Pacific Islander population to immigrate to the United States. Faced with discrimination and prejudice, they formed ethnic communities with levels of solidarity that afforded social support and some protection from negative influences in American society.

Unlike Chinese immigrants, who at first were (and to some extent continue to be) concentrated in urban neighborhoods within major cities, the Japanese dispersed into middle-class suburbs and working class neighborhoods throughout the cities. Second and third generation Japanese-Americans tend to be well educated and economically successful (26). As each generation of Japanese American men becomes more acculturated, its lifestyle becomes more westernized, increasing the risk of becoming hypertensive. While rates of blood pressure are generally low among Japanese, the rate of uncontrolled hypertension among Japanese men aged 18 to 49 is 19.2 percent, which is 3.1 percent above the national average for this sex and age grouping. The higher rates for Japanese men may be related to their rapid assimilation into American society and culture.

In summary, the relatively low rates of hypertension among Asians and Pacific Islanders in America may be explained, in part, by the fact that this large percentage of foreign-born represent a select group of people. Certain lifestyles and attitudes of the Japanese have resulted in positive health status. The relatively low rates of awareness, treatment, control, and knowledge about hypertension and lack of contact with physicians may be a function of factors that are worthy of further study. These include cultural values related to seeking medical care, perceived conflict between western and traditional medicine, a high percentage of foreign-born with continuing language-related barriers, the unavailability of health care providers of the same ethnic background, and a resultant lack of knowledge about American health care.

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